

ALMR INSIDER

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Deployable Communications Assets

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In early April, the Dalton Highway (Haul Road) was flooded from overflow of the Sagavanirktok (Sag) River. This caused a halt in truck traffic on the only overland route for carrying vital supplies, equipment and fuel to and from the North Slope. Governor Bill Walker signed a disaster declaration, which allowed necessary State assets to be deployed to reopen the road, as soon as possible.

The Alaska Land Mobile Radio (ALMR) Operations Manager received a call regarding the possible deployment of the Department of Defense (DOD) owned Transportable Area North (TAN) to provide communications on site for State of Alaska (SOA) workers because the flooding was in an area where there were no communications, except satellite phone. Subsequent to the discussion and assessment of the communication requirements, it was determined that the TAN would not be necessary to provide the level of on-site communications needed. The Operations Manager contacted the Division of Forestry (DNR) inquiring about the use of one of their portable repeaters for the incident. DNR was able to provide a portable repeater and it was used for the duration of the cleanup, providing the needed communications capability.

In situations like this, the SOA also has four trailer-borne communication systems called RAPICOMS, which can be utilized, although not needed in this particular situation. One is assigned to the Division of Forestry, one with the Alaska State Troopers and two with Health and Human Services. These trailers were purchased as part of the SOA strategic communications reserve and provide a substantially greater capability over portable repeaters, and are also a very viable option where the full capabilities of the transportable are not required. Requests for these assets should be coordinated through the SOA Division

of Homeland Security and Emergency Management (DHS&EM). Although one of the transportable systems wasn't deployed in the situation on the Dalton Highway, they are available for a major incident where expanded coverage, site replacement, additional channels and/or reach back capability to the ALMR infrastructure is required. However, their use must be requested and initially approved by the Alaskan Command (ALCOM) Commander.

As previously stated, the transportable systems are assets owned by the DOD. If the SOA identifies a need for the capabilities of a transportable, and it is not a declared emergency, a request to the ALCOM Commander can be made; if approved, the SOA could then execute a contract with Bering Straits Information Technology (BSIT) to deploy it. In the case of a declared emergency, the SOA State Emergency Operations Center (SEOC) would submit a request to the ALCOM Commander, and if approved, it can be deployed for up to 72 hours, after which approval to continue the deployment would be required from the Office of Secretary of Defense (SECDEF) (**NOTE:** See page 4 for deployment approval schematic.)

Non-declared emergency requests to deploy either transportable should be communicated directly to the ALMR Help Desk or Operations Management Office (OMO), who will then coordinate with ALCOM. In the case of a declared emergency, ALMR would contact DHS&EM. Please contact the OMO at 907-334-2634, if you require further information.

(Article by Mr. Del Smith, ALMR Operations Manager)

Reduction in Funding Affects ALMR Maintenance

Funding provided by the State of Alaska (SOA) in support of the Alaska Land Mobile Radio (ALMR) Infrastructure and Operations Maintenance Services (IOMS) contract with Bering Straits Information Technology (BSIT) has been sharply reduced, effective July 1, 2015 (SOA FY16).

The reduction in funding will potentially impact the immediate availability of replacement parts for malfunctioning or failed RF equipment at SOA ALMR sites. The System Manager has worked closely with SOA Enterprise Technology Services (ETS) to identify areas the IOMS contract could be adjusted, in the short term, to address the FY16 funding shortfall. As a result, technician response time and funding for travel to SOA sites, depending upon the

severity of the issue, will be problematic during the upcoming year. The critically important Annual Preventive Maintenance Inspections (PMI) will continue, as will Motorola™ 24/7 monitoring of the System to provide early warning and notification to ALMR staff of any System performance issues. Current Help Desk, System Management and Operations Management services will continue.

ALMR user agencies should contact the Help Desk or the Operations Management Office if additional information regarding the impacts of the funding shortfall are needed.

(Article by Mr. Del Smith, ALMR Operations Manager)

Tech Corner: Hunting Interference

Interference on today's radio systems seems to be a common occurrence, and becoming worse every year, as more communications systems and users share the same radio frequency (RF) spectrum. Over the next few Insider issues, we will look at different types of interference and how to identify them. This is the first step in hunting down any interference source.

The first type of interference we will look at is "Impulse Noise." Impulse noise is created whenever a flow of electricity is abruptly started or stopped. A surprising variety of items can create impulse noise.

Lighting suppression devices at a site

These arc suppressions work by allowing excess voltage to arc to ground. Over time, as they age, the breakdown voltage tends to lower, to the point where the higher power leads to legitimate RF transmissions that cause arcing, which can create receive interference.

Electrical motors from elevators, floor buffers or even FAX machines

Many types of electrical motors have brushes, which can create quite a bit of arcing and sparking. Have you ever looked into the back end of an electric drill and seen the blue sparks around the brushes? That's a good example of impulse noise caused by an electric motor.

Bakery ovens

Bakery ovens have high voltage heating elements - over 2,000 watts. The ovens are typically regulated by turning the heating element on and off, as needed to maintain the desired temperature. This switching action generates impulse noise.

Welding

This is an electric arc that starts and stops every time the welder draws a bead. Need we say more?

Electric fences

Electric fences generate a short pulse of high voltage

then turn it off for a second or two. This allows shocked animals (or humans) time to move away from the fence before it shocks them again.

Power lines, which may arc and spark

Have you ever been near a high voltage transmission line on a damp, foggy or rainy day? Enough said.

Light dimmers

Light dimmers operate by suddenly turning the AC power off part way through the power cycles of the sine wave. This creates impulse noise.

Micro-arcing, or fritting

Micro-arcing, or fritting, is created when RF connections do not make firm contact. Fritting first shows up at peak RF power levels as wideband, intermittent jumps in the noise floor. This can be anywhere from a 5 to 20db jump.

Most of the listed impulse noise sources affect the lower frequencies. It's hard to give a specific number, but it's unlikely to see impulse noise above 500MHz. However, micro-arcing/fritting is the exception since it is generated by the RF signal and can affect reception at any frequency. It is typically very broad-band, over a GHz wide. Micro-arcing/fritting can be caused any of the following sequences of cable mishandling:

- Over torqueing a 7/16 DIN connector. This causes the center pin to move back into the cable a bit.
- Re-opening the connection, perhaps as part of a test
- Re-connecting the cables at the right torque, but now with a pair of center pins that do not make firm contact

There are many possible sources of impulse noise. This list is intended to give you an appreciation of possible sources. When looking for impulse noise, it is important to keep an open mind regarding possible sources.

(Article by Mr. Rich Leber, Technical Advisor with excerpts taken from Anritsu White Paper, Mission Critical Transmission Weekly News, February 15, 2015)

Hazardous Location Certification Transition

When you're operating in environments where flammable or explosive gases, vapors or dust may be present, you should consider communications equipment certified fit for use in a Hazardous Location – often called "HAZLOC."

EXPIRING STANDARD

The established Factory Mutual standard FM3610-88 will expire at the end of 2015. Two-way radios manufactured after that date cannot be sold as "FM Approved." The replacement standard for the Land Mobile Radio industry is TIA4950.

Motorola will be using this standard, with compliance testing performed by Underwriters' Laboratories (UL).

Two-way radios certified to the legacy FM3610-88 standard will be phased out of production, although repair support (from FM-audited repair facilities) and sales of new batteries and accessories will continue.

NEW MARKINGS

Radios and batteries certified to TIA4950 will enter production in the first quarter of 2015. They will be labelled clearly with the new UL markings.

ACTION REQUIRED

In preparation for the FM to UL transition, ensure that your facility documentation defines Hazardous Location requirements in terms of Division, Class and Group rather than simply "FM Approved" or "Intrinsically Safe." Knowing the specific Hazardous Locations classification is important in selecting equipment that is approved for use in those environments.

HAZLOC CLASSIFICATION

Hazardous locations can be found in many industries, including refineries, fuel storage facilities, chemical plants, grain elevators and plastics processing plants. The National Electrical Code (NEC) NFPA 70 defines hazardous locations as areas "where fire or explosion

hazards may exist due to flammable gases or vapors, flammable liquids, combustible dust, or ignitable fibers or filings."

Equipment manufacturers do not determine the need for "HAZLOC" products, or evaluate the environment in which the radios will be used. The Hazardous Location classification is determined by the Authorities Having Jurisdiction (AHJ) over the particular facility. For example, the fire marshal, insurance provider or the facility safety expert.

NATIONAL ELECTRICAL CODE (NEC) NFPA 70

Classes

- Class I: Flammable Gases, Vapors or Liquids
- Class II: Combustible Dust
- Class III: Ignitable Fibers and Flyings

Division (Area Classification)

- Division 1 - Locations where ignitable gas/vapor/liquid/dust are present continuously, or some of the time under normal operating conditions
- Division 2 - Locations where ignitable gas/vapor/liquid/dust are not likely to exist under normal operating conditions

Groups (Organized by Classes)

Class I - Gas Groups

- Group A - Acetylene and equivalent gas groups
- Group B - Hydrogen and equivalent gas groups
- Group C - Ethylene and equivalent gas groups
- Group D - Methane and equivalent gas groups

Class II - Dust Groups

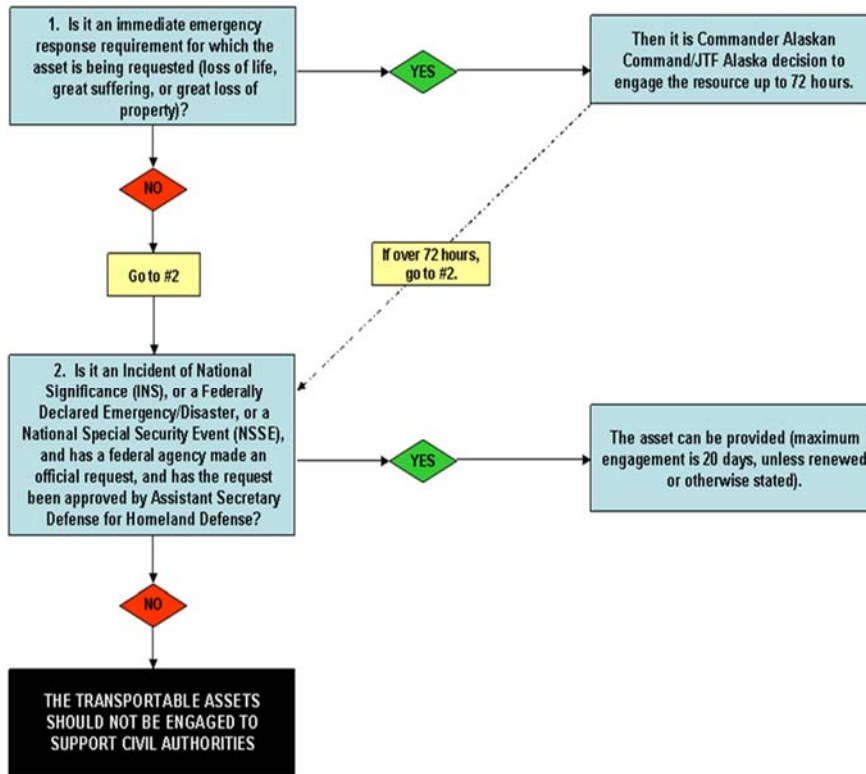
- Group E - Conductive dust (mechanical – factories, and recyclers)
- Group F - Combustible carbon dust (charcoal and coke dust) - above ground only
- Group G - Grain dust

Class III - Fibers (has no sub-groups)

	TODAY	FUTURE
Certification Lab	FM Approvals (FM)	Underwriters' Laboratories (UL)
Standard Applied	FM 3610_88	TIA-4950
Classification Rating	Division 1 Class I, Groups C, D, Class II, Groups E, F, G, Class III, T3C	Division 1 Class I, Groups C, D, Class II, Groups E, F, G, Class III, T3C
For use in Hazardous Locations	Yes	Yes
Label example		

(Article by Ms. Sherry Shafer, ALMR Documentation Specialist, as extracted from Motorola™ Fact Sheet, "FM to UL Transition," undated)

Deployable Communications Assets (continued)



(Transportable communications system - deployment approval schematic.)

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Need ALMR Training?

ALMR currently offers user training. Please contact the Operations Management Office for details/ assistance at any of the following numbers.

- Del Smith 907-334-2636
- Rich Leber 907-269-5607
- Sherry Shafer 907-269-8408

Your request will be passed on to the training coordinator and you will be notified when training is scheduled for your area.

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